How would the graphs change if you threw a balloon instead of a basketball?
d-t, v-t, a-t

moon landing video
https://www.youtube.com/watch?v=5C5_dOEyAfk
feather videos
https://www.youtube.com/watch?v=_XJcZ-KoL9o&feature=related
http://io9.gizmodo.com/you-know-how-this-experiment-ends-but-you-should-watch-1653628513?utm_campaign=socialflow_io9_facebook&utm_source=io9_facebook&utm_medium=socialflow

for the balloon, the acceleration due to gravity was only about 2.2 m/s^2 because of air resistance.

terminal velocity - air resistance increases as speed increases until the object falls at a constant speed - the terminal velocity - air drag balances gravity.

eg. Isaac throws the basket up at 2.7 m/s from a height of 1.30 m above the ground. Determine:

a) acceleration i) going up ii) at the top iii) going down
b) determine the highest point for the ball.
c) determine the time to get to the highest point.
d) determine the velocity i) at the top ii) falling at the same level it was thrown iii) at the ground
e) sketch the d-t, v-t, a-t graphs (initial point, max

point, final point)

f) sketch the v-t graph for a balloon launched with the same velocity but with a 3.0 m/s terminal velocity.

a) $-9.81 m/s^2$ all the time

b) $v^2 = u^2 + 2as$ $s=(2.7m/s)^2/(2x9.81m/s^2)$

2.7x2.7=7.29 7.29/(2x9.81)=0.3716

0.37m above the throwing point

or 1.67m above ground

c) $v=u+at$ $t= -2.7m/s/-9.81m/s^2$

2.7/9.81=0.2752 = 0.28s

d) v at top = 0 m/s

v at same height = -2.7m/s by symmetry

v at ground

s=-1.3m

u=2.7m/s

$a=-9.81m/s^2$

v=?

$v^2 = u^2 + 2as$

$v^2 = (2.7x2.7)+(2x9.81x1.3)=32.796$

v= Sqrt(32.796)=5.726779199515204

v=5.7m/s

Quiz:

$v = (1.0 +/- 0.1 m/s^2)t + 4.0+/- 0.2m/s$

/6 marks

b) a=slope = 1.0 m/s^2
c) area under the graph = 1/2(4+12)4 =32m
d) $s=1/2at^2 + ut$ = 1/2(1)(35x35)+(4x35)=
35x35=1,225 1,225/2=612.5 612.5+(4x35)=752.5
7.5 x 10^2 m
2. s=4.0m v=20.0m/s t=? u=0
s=1/2(v+u)t
t= 4x2/20=0.4 = 0.40s

3a) 70/3.6=19.4444 m/s
a=(v-u)/t = (19.444)/2.5=7.7776 = 7.8m/s
b) s= 19.44444x0.5=9.72222
s=1/2(v+u)t= 0.5x(19.4444)x(2.5)=24.3055
24.3055+9.7222=34.0277 =34m
c) vavg = s/t = 34/3=11.3333 = 11m/s

a) $s=1/2at^2$ = 0.5x8.9x9=40.05 m
gazelle 12x3=36 +10=46m cheetah doesn't catch the gazelle
b) $12t + 10 = 0.5(8.9)t^2$
$0 = 4.45t^2 -12t - 10$
[-b+/-root(b^2-4ac)]/2a or graph calculator see where the lines cross

[12+/- root(144-(4)4.45(-10))]/2(4.45)
= (12+/-17.944)/2x4.45
t=3.36s